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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/010,731	11/13/2001	Jihong Liang	MOBT:193--2	4312

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EXAMINER
IBRAHIM, MEDINA AHMED

ART UNIT	PAPER NUMBER
1638	10

DATE MAILED: 07/01/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/010,731	LIANG ET AL.	
	Examiner	Art Unit	
	Medina A Ibrahim	1638	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 April 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26, 28-29, and 31-34* is/are pending in the application.

4a) Of the above claim(s) *1-13,18-24,31 and 32* is/are withdrawn from consideration.

5)☒ Claim(s) *15* is/are allowed.

6)☒ Claim(s) *14,17,25,28,29 and 33* is/are rejected.

7)☒ Claim(s) *16,26 and 34* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☒ The proposed drawing correction filed on *26 April 2002* is: a)☒ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Election/Restrictions

Applicant's election with traverse of Group II in Paper No. 9 filed 4/16/03 is acknowledged. The traversal is on the ground(s) that the restriction between the host cell of claim 14 in Group I and the plant cell of claim 15 in Group II is improper because claim 14 and claim 15 relate as species and genus, and therefore should be examined together. Applicant further argues that in the previous restriction requirement of the parent case, claims in present groups I and II were placed within one group. Applicant urges that claim 14 be regrouped with Group II.

Applicant's argument regarding rejoining claim 14 with Group II is found persuasive, and therefore, claim 14 is hereby rejoined with Group II. However, the argument regarding placing claims in Groups I and II within one group is not persuasive because the two groups are directed to patentably distinct inventions as set forth in the last Office action. In addition, the invention of Group I has already been examined in a parent application and a patent is issued. Therefore, claims 1-13 and 18 will not examined with Group II. The requirement is still deemed proper and is therefore made FINAL.

The preliminary amendment (A) filed 04/16/03 has been entered. Claims 27 and 30 have been cancelled. Claim 34 has been added. Therefore, Claims 1-26, 28-29, 31-34 are pending.

Claims 1-13, 18-24, and 31-32 are withdrawn from consideration as being drawn to a non-elected invention.

Claims 14-17, 25-26, 28-29, and 33-34 are under examination.

Sequence Listing

Applicant's CRF and paper sequence listing filed 13 November 2001 have been entered. However, this application fails to comply with the requirements of 37 CFR 1.821-1.825 because the sequence listing of Fig. 1-3 have not been identified by SEQ ID NO: in the Description of the Drawings on page 41 of the specification. Applicant is respectfully requested to identify the sequences in Fig. 1-3 or to submit a new Sequence Listing which comprises said sequence.

Drawings

The drawings filed on 26 April 2002 are approved by the Examiner.

Priority

An application in which the benefits of an earlier application are desired must contain a specific reference to the prior application(s) in the first sentence of the specification or in an application data sheet (37 CFR 1.78(a)(2) and (a)(5)). Also, the current status of all nonprovisional parent applications referenced should be included.

Claim Objections

Claim 26 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 16-17, 25, 28-29 and 34 are objected to because of the following informalities:

In claim 16, "potato plant" is redundant. It is suggested that "plant" be deleted.

In claim 17, in line 9, it is suggested that "under conditions effective" be deleted because the phrase is redundant.

In claim 25, "through codon degeneracy of the genetic code" is redundant. The phrase should be deleted.

In claim 28, it is suggested that, "comprise" should be changed to --comprises--.

In claim 29, second "seed" should be changed to ---seeds---, for proper dependency.

In claim 34, ---from a plant--- should be inserted before "selected", for clarification.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 14, 17, 25, 28-29 and 33-34 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 14 is indefinite for depending upon the non-elected claim 10.

Claim 17 is indefinite in the recitation of "method of using", line 1 because it is unclear for what purpose the DNA segment is being used. The preamble of the claim should reflect that it is a method of making the polypeptide. Also, "said antifungal polypeptide", in lines 4-5, lacks antecedent basis.

Claim 25 is an omnibus type claim because it refers to a figure. The claim recites "the nucleotide sequence of FIG.1". MPEP states as follows: "Where possible, claims

are to be complete in themselves. Incorporation by reference to a specific figure or table "is permitted only in exceptional circumstances where there is no practical way to define the invention in words and where it is more concise to incorporate by reference than duplicating a drawing or table into the claim. Incorporation by reference is a necessity doctrine, not for applicant's convenience." Ex parte Fressola, 27USPQ2d 1608, 1609 (Bd. Pat. App. & Inter. 1993) (citations omitted). See MPEP § 608.01(m). It is suggested that ---(SEQ ID NO:10)-- be inserted after "FIG.1". Dependent claims 28-29 are included in the rejection.

Claim 25 is indefinite because the nucleotide sequence "from about " position 18 through "about" position 507 of SEQ ID NO: 10, and "from about" position 105 to "about" position 242 of SEQ ID NO: 13 or the complements thereof, in parts b), c), and e) cannot encode SEQ ID NO: 2 or 14. what is encompassed in "about" positions is unclear. It is suggested that "from about position 18 through about position 507 of SEQ ID NO: 10" and "from about position 105 to about position 242 of SEQ ID NO: 13" be replaced with ---from position 18 to 507----, and ---from position 105 to 242----.

Claim 25 is indefinite for failing to recite the specific hybridization and wash conditions (salt concentration, temperature, time) required for "stringent" conditions. The specification fails to define the appropriate wash/hybridization conditions, and hence, what is encompassed by the claim is unclear. Appropriate correction is required to more clearly define the metes and bounds of the claim.

Claim 33 is vague and indefinite because the method steps are unrelated. The first step of providing to a plant an antifungal amount of the disclosed polypeptide is

unrelated to the second step of transforming the plant with a DNA encoding the polypeptide. Also, the language "controlling" in line 1 is subject to individual interpretations. It is suggested that "controlling" be replaced with ---inhibiting---, or ---killing---. Also, "said polypeptide" in line 3, lacks antecedent basis. If Applicant intends, ----A method of [controlling] a plant fungus, said method comprising transforming a plant with a vector comprising a DNA encoding antifungal polypeptide having the amino acid sequence of SEQ ID NO: 2 or 14, allowing expression of said antifungal polypeptide, wherein said antifungal polypeptide is expressed in the plant---, the claim should be amended as such.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 14, 25 and 28-29 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a recombinant host cell, a plant, seed and progeny stably transformed with a vector comprising a nucleotide sequence encoding an antifungal polypeptide having the amino acid sequence of SEQ ID NO: 2 and 14, and a method of transforming a plant with said nucleotide sequence to confer antifungal activity, does not reasonably provide enablement for a transgenic plant cell or plant comprising any nucleotide sequence that hybridizes to the full-length, fragments, and complements of the disclosed nucleotide, encoding an antifungal polypeptide, or transgenic plant cell comprising any 15 contiguous amino acids of SEQ

ID NO:2 or 14 having antifungal activity, and a method of using said nucleotide sequences to provide antifungal resistance in plants. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims.

Claims are broadly drawn to a recombinant host cell comprising a DNA segment that encodes a polypeptide comprising at least 15 amino acids (Note claim 14 is read as it contains all limitations of the cancelled parent claims) having antifungal activity, and any DNA segment that hybridizes to a full-length or a fragment of the disclosed DNA sequences under unspecified stringent hybridization conditions, and encoding a polypeptide having antifungal activity.

Applicant teaches isolation and sequencing of a polypeptide from alfalfa and cloning of cDNAs, AlfAFP1 and AlfAFP2 using specific primers (Example 4). Applicant teaches that AlfAFP1 cDNA encodes a polypeptide that has a potent antifungal activity against Fusarium *culmorum and Verticillium dahliae* (examples 1-3, Table 1). Applicant further teaches a vector comprising the FMV promoter operably linked to a full length AlfAFP1 nucleic acid sequence and teaches transformation of potato plants with said vector. Applicant teaches that transgenic plants expressing AlfAFP1 polypeptide (SEQ ID NO:2) have resistance to infection by *V. dahliae* as determined by a root dip assay (Example 5).

Applicant has not provided guidance for a transgenic plant comprising a DNA sequence that hybridizes to the disclosed nucleotide sequences, and still encoding a polypeptide having antifungal polypeptide. Applicant has not provided guidance for

specific hybridization stringent conditions, which enable one skilled in the art obtain all DNA sequences encoding functional polypeptides having the desired antifungal activity. Applicant has not provided guidance for transgenic plants having resistance against exemplified or non-exemplified fungi as result of expressing 15 contiguous amino acids of SEQ ID NO: 2 or 14 as recited in claim 14, or the partial DNA and hybridizing sequences as recited in claim 25. No guidance has been provided for modifications to the disclosed DNA sequences that resulted in a DNA segment encoding a 15 contiguous amino acids having antifungal activity or regions of the disclosed DNA sequences which encode functional proteins. Absent such guidance, one skilled in the art is left with undue trail and error experimentation considered undue. Undue experimentation would be required to screen DNA sequences that hybridize to nucleotide sequences encoding SEQ ID NO: 2 and 14, and test said hybridizing sequences for their ability to provide fungal resistance following their expressions in transgenic plants.

The state of the prior art teaches unpredictability inherent in DNA/protein function if one or more amino acids/bases in that DNA/protein are modified. For example, Lazar et al (Molecular and Cellular Biology, March 1988, Vol. 8, No. 3, pp. 1247-1257 (U)) teach that a mutation of aspartic acid 47 and leucine 48 of a transforming growth factor alpha results in different biological activities (see at least the Title). Broun et al (Science, 13 November 1998, vol. 282, pp. 131-133 (U)) teach that as few as four amino acid substitutions in a protein can change the protein activity (Abstract). Note, the nucleotide

sequences encoding the proteins (mutated and original) disclosed by either Lazar or Broun would hybridize to each other under any stringent conditions.

Therefore, given the breadth of the claims, the nature of the invention, the unpredictability in the art with respect to DNA/protein modifications, the limited guidance and working examples in the specification as discussed supra, and the state of the prior art, the claimed invention is not enabled throughout the broad scope. See In re Wands 858 F.2d 731, 8USPQ2nd 1400 (Fed. Cir, 1988).

See, also, *Amgen Inc. Chugai Pharmaceutical Co. Ltd.*, 18 USPQ 2d 1016 at 1027 (Fed. Cir. 1991) where the court held that the disclosure of a few gene sequences did not enable claims broadly drawn to any analog thereof.

Written Description

3. Claims 14, 25 and 28-29 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims are broadly drawn to a recombinant host cell comprising a DNA segment that encodes a polypeptide comprising at least 15 amino acids (Note claim 14 is read as it contains all limitations of the cancelled parent claims) having antifungal activity, and any DNA segment that hybridizes to the disclosed DNA sequences under unspecified stringent hybridization conditions and partial DNA sequences, all encoding a polypeptide having antifungal activity. In contrast, Applicant describes transgenic plant/

cell/seed/progeny comprising a nucleotide sequence encoding SEQ ID NO: 2 and 14. These are genus claims.

Applicant has not described all the hybridizing nucleotide sequences, partial DNA and amino acid sequences capable of providing resistance against fungi in transgenic plants. One skilled in the art would not expect that most of the hybridizing sequences of claim 25 will encode a polypeptide having the antifungal activity of SEQ ID NO:2 and 14 because the unspecified stringent conditions will yield unrelated sequences. A substantial variation in function is expected among polypeptides that share 15 contiguous amino acids of SEQ ID NO: 2 or 14, and among nucleotide sequences that share the partial DNA sequences as recited in claim 25. Therefore, transgenic host cells, plants, seed, and progeny comprising said sequences are not described. Given this lack of description of representative species encompassed by the genus of the claims, the specification fails to sufficiently describe the claimed invention in such full, clear, concise, and exact terms that a skilled artisan would recognize that Applicant was in possession of the invention as broadly claimed at the time of filing.

Therefore, weighing all factors above, the claimed invention does not meet the current written description requirements.

See, *University of California v. Eli Lilly and Co.* 43 USPQ2d 1398 (Fed. Cir. 1997) where it states "A description of a genus of cDNA may be achieved by means of a recitation of a representative number of cDNAs, defined by nucleotide sequence, falling within the scope of the genus or of a recitation of structural features common to members of the genus, which features constitute a substantial portion of the genus. See

also where the court teaches that the disclosure of a process for obtaining cDNA from a particular organism and the description of the encoded protein fail to provide an adequate written description of the actual cDNA from the organism which would encode the protein from that organism, despite the disclosure of a cDNA encoding that protein from another organism. See, also Written description Examination Guidelines published in Federal Registry/Vol. 66, No.4/Friday, January 5, 2001/Notices).

Remarks

Claims 14-17, 25-26, 28-29, and 33-34 are free of the prior art of record.

Claim 15 is allowed.

Claim 26 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 16-17 and 33-34 would be allowable if the 112, 2nd rejection and objections above are obviated.

Papers related to this application may be submitted to Technology Sector 1 by facsimile transmission. Papers should be faxed to Crystal Mall 1, Art Unit 1638, using fax number (703) 308-4242. All Technology Sector 1 fax machines are available to receive transmission 24 hrs/day, 7 days/wk. Please note that the faxing of such papers must conform with the Notice published in the Official Gazette, 1096 OG 30 (November 15, 1989).

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Medina A. Ibrahim whose telephone number is (703) 306-5822. The Examiner can normally be reached Monday-Thursday from 8:30AM to 5:30PM and every other Friday from 9:00AM to 5:00PM.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Dr. Amy Nelson, can be reached at (703) 306-3218.

Any inquiry of a general nature or relating to the status of this application should be directed to the receptionist whose telephone number is (703) 308-0196.

MAI
6/26/03

Medina Ibrahim